Environmental Management - Grand Junction Office

MOAB UTAH UMTRA

UMTRA Project

Waste Management Plan

Moab UMTRA Project

July 2008

U.S. Department of Energy

Office of Environmental Management

Work Performed by the Technical Assistance Contractor under DOE Contract No. DE-AC30-07CC60012
and the Remedial Action Contractor under DOE Contract No. DE-AT30-07CC00014
for the U.S. Department of Energy Office of Environmental Management, Grand Junction, Colorado.
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Waste Management Plan

Moab UMTRA Project
Review and Approval

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Preface

This *Waste Management Plan for the Moab Uranium Mill Tailings Remedial Action (UMTRA) Project* describes the strategies that will be used to manage wastes generated by the Moab UMTRA Project, including both the Moab site with the mill-tailings pile and the Crescent Junction site with the disposal cell. The plan is based on the U.S. Department of Energy (DOE) *Waste Management Guidance for the Moab UMTRA Project* (see Appendix A), which explains the regulatory authority for the site and the nature of wastes that will be generated and provides the DOE's corresponding guidance for managing site wastes.

Summary

This document pertains to the management of wastes generated throughout the Moab UMTRA Project, including the contaminated area where residual radioactive material (RRM) is being remediated, transportation of the remediated RRM, RRM disposal in the Crescent Junction disposal cell, and the adjacent uncontaminated support areas where office trailers and other facilities that support site operations are located. Wastes were generated in the past by pre-DOE historical site processing, maintenance, and decommissioning activities and are now being generated by DOE contractor and subcontractor activities including pile remediation activities. If deemed necessary, this guidance will be revised to include the management of wastes generated as the result of remediation of RRM located on properties within the vicinity of the Moab site.

Waste Management Strategy

RRM and non-RRM wastes will be generated at the Moab and Crescent Junction sites. There are different requirements for managing each type of waste.

Residual Radioactive Material

The Uranium Mill Tailings Radiation Control Act (UMTRCA) Section 101(7) and 40 Code of Federal Regulations (CFR) 192.01(a) define RRM as "(1) waste (which the Secretary [of Energy] determines to be radioactive) in the form of tailings resulting from the processing of ores for extraction of uranium and other valuable constituents of the ores; and (2) other wastes (which the Secretary [of Energy] determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials." The Moab UMTRA Project DOE personnel, as representative of the Secretary of Energy, have the authority to determine what constitutes RRM.

RRM is the primary waste generated. All waste generated within the boundary of the contaminated area is considered RRM unless determined otherwise by radiological surveys or other information and designated as non-RRM by DOE. Waste generated outside the contaminated area may be deemed RRM if it exceeds the standards provided at 40 CFR 192.

Most of the RRM in the contaminated area is in the form of uranium mill tailings, mill debris, and contaminated soils located in the tailings pile. Tailings have also been scattered throughout the contaminated area as windblown and waterborne contamination. The tailings pile and adjacent areas also contain the demolished remnants of production and support facilities from the former mill site. RRM in the form of contaminated ground water also exists beneath the Moab site.

Some RRM may be combined with other hazardous components that pose significant safety and health risks to workers or may pose long-term environmental risks. Special management may be warranted to mitigate the risks posed by RRM combined with other hazardous components prior to disposal of this waste.

RRM shall be disposed of at the Crescent Junction disposal site in accordance with the approved remedial action plan. RRM combined with hazardous components other than radioactivity may also be placed at the Crescent Junction disposal site if it meets the Waste Acceptance Criteria (WAC).

As noted previously, environmental statutes such as Resource Conservation and Recovery Act (RCRA) or Toxic Substances Control Act (TSCA) do not regulate RRM, including RRM combined with other hazardous components, because UMTRCA is the regulatory authority for RRM. However, other hazards in RRM that present an unacceptable risk to workers or the environment may necessitate, as a best management practice, the use of more protective management methods, such as additional safety controls or isolation or stabilization of the waste, prior to disposal at the Crescent Junction disposal site. Unforeseen circumstances may justify the disposal of RRM combined with particularly hazardous components in an appropriate off-project facility. DOE will make decisions on a case-by-case basis concerning the methods needed for the special management of RRM combined with other hazardous components.

RRM may be decontaminated if warranted, feasible, and cost effective. Reusable equipment or materials that become radioactively contaminated during remedial action should be decontaminated whenever possible. If it is not feasible or cost effective to decontaminate reusable equipment or materials, they may be disposed of at the Crescent Junction disposal site.

Non-Residual Radioactive Material

Waste generated outside the contaminated area is not considered RRM unless identified as such by radiological surveys or other information and designated as RRM by DOE. Non-RRM waste is not governed by UMTRCA but is governed by other statutes such as RCRA.

Non-RRM waste includes materials such as office trash or sanitary waste generated in the support areas. Non-RRM waste may be generated with other hazardous components, such as waste generated from the maintenance of equipment (e.g., used oil, solvents, fluorescent bulbs, etc.). Hazardous components of non-RRM waste may be subject to more stringent regulation, such as the hazardous waste regulations in 40 CFR 261 and the corresponding state of Utah hazardous waste regulations. Non-RRM waste shall be managed in compliance with applicable federal (RCRA or TSCA), state, and local statutes, ordinances, and regulations and disposed of at an appropriate off-site facility.

Waste Minimization and Pollution Prevention

Activities shall be evaluated to identify waste minimization and pollution prevention opportunities, using such methods as source reduction, product substitution, inventory control, equipment replacement or modification, reuse and recycling, decontamination, or treatment. The contractor shall make reasonable efforts to minimize the generation of wastes and to recycle wastes and other materials. Potential improvements must be feasible and cost effective.

1.0 Plan for Managing Moab UMTRA Project Wastes

1.1 Introduction

The Moab UMTRA Project (the Project) is an UMTRCA Title I processing site[1] owned and operated by the DOE. The Project includes both the mill tailings pile area in Moab and the disposal cell area in Crescent Junction. DOE has been tasked with remediation of the site and is responsible for properly managing all wastes generated from site activities, including operation, maintenance, and remediation activities. This Waste Management Plan describes practices that will be used for managing site wastes. Wastes shall be managed in accordance with the guidelines and requirements of DOE's *Waste Management Guidance for the Moab UMTRA Project* (see Appendix A), the Title 42 United States Code Section 7901 (42 USC 7901) *et seq.*, and the Title 40 CFR Part 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," and will comply with applicable federal, state, and local statutes, ordinances, and regulations.

1.2 Purpose and Scope

The purpose of this plan is to provide direction for properly managing wastes generated at the Moab and Crescent Junction support facilities, including transportation and disposal in the Crescent Junction disposal cell, in accordance with applicable federal, state, and local requirements and in a manner that is protective of human health and the environment. This plan pertains to wastes generated within the contaminated area (CA) where RRM is located and in the uncontaminated area outside the CA, where office trailers and other facilities that support site operations are located. This plan encompasses wastes generated by pre-DOE historical activities, such as ore processing, site maintenance, and decommissioning, and wastes generated by DOE contractor/subcontractor activities, such as investigation and characterization of site environmental media (surface water, ground water, soils, air), operation and maintenance of site facilities or equipment, remediation of RRM, and transportation and disposal of RRM.

This plan does not address the management of non-RRM wastes potentially encountered at properties in the vicinity of the Moab site as a result of the remediation of RRM. If deemed necessary, this plan will be revised to include such wastes.

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1.3 Roles and Responsibilities

DOE, through the *Waste Management Guidance for the Moab UMTRA Project*, provides guidance for the management of all anticipated Moab UMTRA Project wastes and has overall authority to concur with the final management remedy for any waste that is RRM.

DOE Technical Assistance Contractor (TAC), Remedial Action Contractor (RAC), and subcontractor personnel are responsible for the proper management of Moab UMTRA Project wastes and must adhere to the principles and requirements of this plan. Key waste-management responsibilities for the specific contractor positions listed below include, but are not limited to, the following:

[1]The Moab UMTRA Project was designated an UMTRCA Title I processing site by the Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001 (Spence Act), Public Law 106-398.

1.3.1 TAC and RAC Project Managers

Project Managers are responsible for providing operations management by interfacing with DOE, the Operations Managers, and personnel from the Health and Safety (H&S), Radiological Controls (RadCon), and Environmental Compliance (EC) groups as necessary to facilitate proper management of wastes.

1.3.2 RAC Operations Managers

The Moab and Crescent Junction Operations Managers are responsible for managing and coordinating all RAC personnel. The Managers interface with personnel from H&S, EC, Operations field personnel, and any subcontractors, as necessary, to facilitate proper management of wastes. Project Managers may also assume the role of Operations Managers if a Project Manager is not designated or available (i.e, TAC organization).

1.3.3 TAC and RAC Health and Safety Managers

H&S Managers support the needs of the Operations Managers. H&S personnel are responsible for the following with regard to wastes: collecting and evaluating worker hazard data, mitigating worker health risks based on industrial hygiene hazards, determining industrial hygiene hazard levels, directing the proper management of waste based on its industrial hygiene hazard level, and facilitating the release of waste from industrial hygiene controls.

1.3.4 TAC and RAC Radiological Controls Personnel

RadCon personnel support the Operations Managers' needs. RadCon personnel are responsible for mitigating work health risks based on the radiological hazard, determining radioactivity levels, directing the proper management of wastes based on its radioactivity level, and facilitating the radiological release of wastes from the CA.

1.3.5 RAC Environmental Compliance

EC personnel support the needs of the Operations Managers. EC personnel are responsible for the following with regard to wastes: interpreting and implementing DOE's *Waste Management Guidance for the Moab UMTRA Project* and other environmental regulations (e.g., RCRA, TSCA) as necessary to facilitate proper management, collecting and evaluating environmental data, and recommending management remedies for RRM combined with or suspected of being combined with other hazardous components.

1.3.6 Operations Field Personnel

Operations field personnel support the needs of the Operations Managers. Operations field personnel are responsible for the following with regard to wastes: reporting RRM that is suspected of being combined with other hazardous components to H&S personnel and the appropriate Operations Manager, and interfacing with remediation subcontractors, as necessary, to facilitate proper management of wastes.

A diagram of the overall relationship of these personnel with regard to the management of Moab UMTRA Project wastes is provided in Figure 1−1. Further details about personnel functions and responsibilities for managing RRM combined with or suspected of being combined with other hazardous components are provided in Section 3.0.

1.4 Organization of Waste Management Plan

The remaining sections of the plan discuss the requirements for managing wastes and are organized as follows: a general description of wastes and strategies for their management are discussed in Section 2.0, and the specific requirements for managing RRM combined with or suspected of being combined with other hazardous components are discussed in Section 3.0.

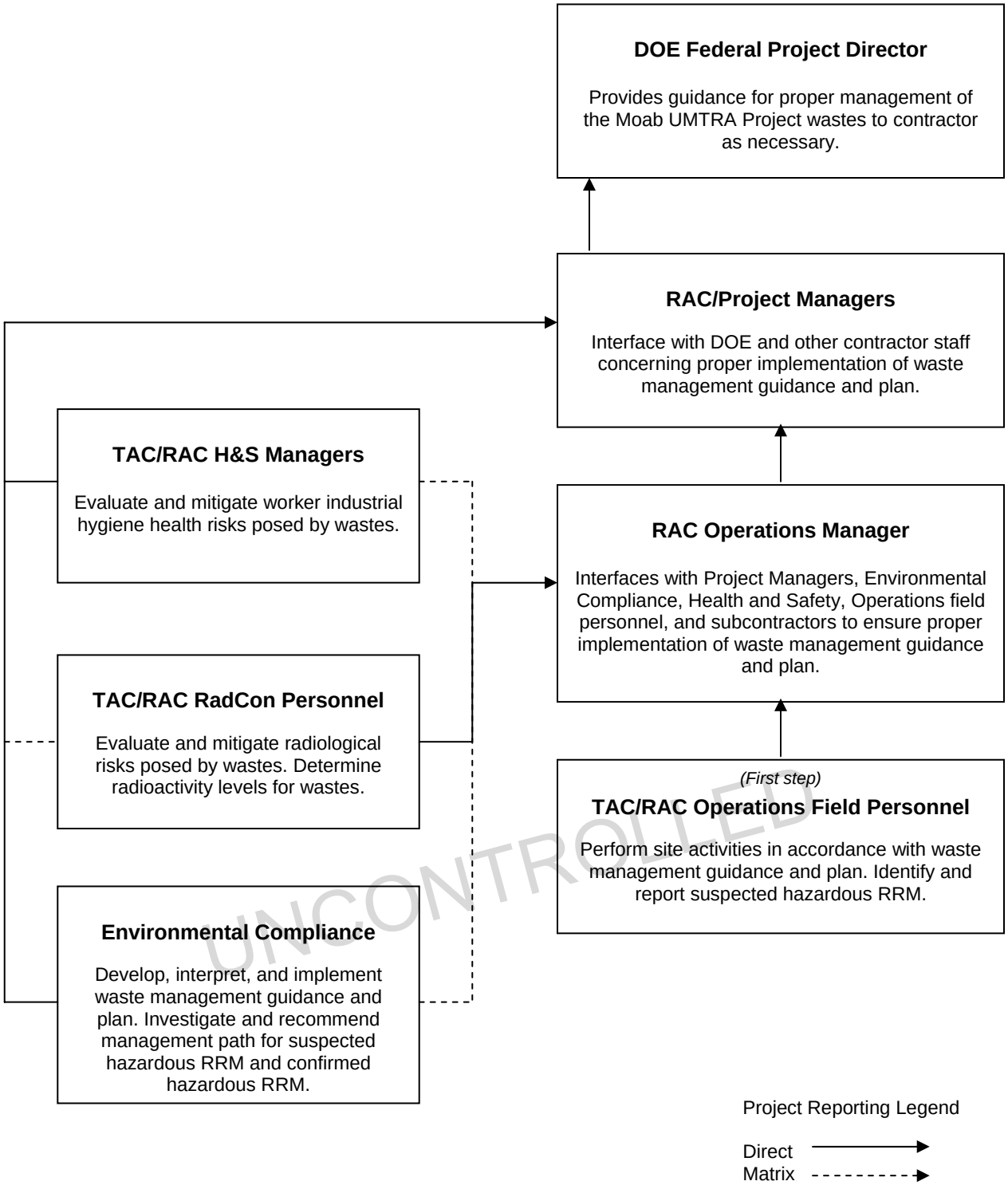


Figure 1–1. Waste Management Matrix

2.0 Description of Site Waste Management Strategy

2.1 Introduction

This section describes the general types of waste that will be generated at the Project and the strategies that will be used for their management.

2.2 Waste Description

Project wastes can be categorized as RRM or non-RRM waste. Following are descriptions of each.

2.2.1 Residual Radioactive Material Waste

RRM is the primary waste generated by the Project. All waste generated within the CA is considered RRM unless determined otherwise by radiological surveys or other information and designated as non-RRM by DOE.

RRM is any material that meets the following definition for RRM provided in Section 101(7) of UMTRCA, 42 USC 7911, and 40 CFR 192.01(a):

(1) Waste (which the Secretary [of Energy] determines to be radioactive) in the form of tailings resulting from the processing of ores for extraction of uranium and other valuable constituents of the ores; and (2) other wastes (which the Secretary [of Energy] determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials. The DOE Project personnel, as representatives of the Secretary of Energy, have the authority to determine what constitutes RRM.

RRM includes the following:

- Routine RRM—Consists of uranium-mill tailings and radioactively contaminated soil and mill debris. Most of the routine RRM in the CA is located in the tailings pile that covers approximately 130 acres of the site. Tailings have also been scattered throughout the other parts of the CA as windblown and water-borne contamination. Areas adjacent to the tailings pile also contain the demolished remnants of production and support facilities from the former mill.
- Hazardous RRM[1] (HRRM) —Consists of RRM combined with other hazardous or toxic components that pose significant safety and health risks to workers or may pose long-term environmental risks. It is possible HRRM will be encountered during remediation activities because it is suspected that many types of waste were disposed of on site during historical operations, such as wastes generated by the former mill's processing operations and wastes generated as a result of the mill's demolition.

[1] The term "hazardous RRM" was created specifically for this waste management plan and has no regulatory significance.

UMTRCA Title I is the overriding authority for the remediation of RRM. Other environmental statutes, such as RCRA and TSCA, do not have regulatory authority over RRM or its management as waste, including RRM combined with other hazardous components.

2.2.2 Non-Residual Radioactive Material Waste

Waste generated in the uncontaminated area outside the CA is considered non-RRM unless radiological surveys or other information indicate otherwise.

Non-RRM waste is material that does not meet the aforementioned definition of RRM. Generally, non-RRM waste is nonradioactive material that meets the definition of solid waste provided at 40 CFR 261.2. Typical non-RRM waste consists of materials such as office trash, construction debris, and discarded wood, plastic, or metal.

Non-RRM waste that contains other hazardous components may be generated in the uncontaminated support area outside the CA or within the CA and is non-radioactive, such as used oil or other spent petroleum products generated from equipment maintenance. Oil changes within the CA would be done under supervision of a radiological control technician to ensure oil does not become radiologically contaminated.

Non-RRM waste is not governed by UMTRCA, but is instead governed by other statutes, such as RCRA or TSCA. Non-RRM waste combined with other hazardous components is subject to more stringent regulation than typical non-RRM solid waste, such as by the hazardous-waste regulations at 40 CFR 261 and the corresponding state of Utah hazardous-waste regulations at Title R315 of the Utah Administrative Code (UAC R315).

2.2.3 Investigation-Derived Waste

Investigation-derived waste (IDW) is waste generated in the field during site investigation and monitoring activities associated with ground water or soils. IDW includes various types of waste, including personal protective equipment, disposable sampling equipment, excess soil (well-drilling cuttings, trenching leftovers), excess ground water (well development or purge water), or miscellaneous trash (empty containers, plastic, packaging materials).

IDW may be RRM or non-RRM waste. IDW may also contain hazardous components other than radioactivity. IDW will be managed in a manner that is consistent with the UMTRA Project *Technical Approach for the Management of UMTRA Ground Water Investigation-Derived Wastes* (as revised for the UMTRA Ground Water Project), the U.S. Environmental Protection Agency (EPA) *Guide to Management of Investigation-Derived Waste*, and the requirements of this plan.

2.3 Waste Management Strategy

There are different requirements for managing RRM and non-RRM waste because of differing regulating authorities and waste composition.

2.3.1 Residual Radioactive Material

RRM shall be remediated in accordance with the standards for the control and cleanup of RRM provided in 40 CFR 192 Subparts A through C. Additional cleanup standards may be established for radioactive contaminants present in RRM other than radium-226 (Ra-226), such as thorium or uranium, based on 10 CFR 834, DOE Order 5400.5, various guidance from DOE, EPA, the Nuclear Regulatory Commission (NRC), and human health and ecological risk assessments. DOE will be asked to approve cleanup standards for radioactive contaminants in RRM that are not established in 40 CFR 192.

Routine RRM such as uranium mill tailings and radioactively contaminated soil and debris will be excavated and handled using standard RRM remediation/construction methods[1] and as required by the approved remedial action plan and work plans. H&S procedures for controlling radiological contamination will be used to protect site workers, the public, and the environment. Routine RRM meets the NRC-approved WAC. RRM that meets the WAC will be transported and disposed of at the Crescent Junction disposal site.

HRRM shall also be remediated in accordance with the standards in 40 CFR 192, Subparts A through C. Though the hazardous components in HRRM are not subject to regulation by environmental statutes such as RCRA or TSCA, additional cleanup standards may be established for these hazardous components as a best management practice. Hazardous components that present an unacceptable risk to workers or the environment may necessitate, as a best management practice, further characterization efforts and the use of more protective excavation and handling methods. HRRM that meets the appropriate WAC may be placed at the Crescent Junction disposal site with DOE concurrence. The management requirements for HRRM and suspected hazardous RRM[2] (SHRRM) are discussed more thoroughly in Section 3.0.

RRM may be decontaminated if warranted, feasible, and cost effective. Reusable equipment or materials that become radioactively contaminated during remedial action should be decontaminated whenever possible. If it is not feasible or cost effective to decontaminate reusable equipment or materials, they may be disposed of at the disposal site. The *Health and Safety Plan* (DOE-EM/GJ1038) contains procedures for decontaminating RRM, including release limits for radioactivity.

[1] Standard RRM remediation/construction methods are those that do not require any extraordinary handling, storage, or treatment activities, such as those that might be required for RRM combined with other hazards.

[2] The term "suspected hazardous RRM" was created specifically for this waste management plan and has no regulatory significance.

2.3.2 Non-Residual Radioactive Material Waste

Non-RRM waste shall be managed in accordance with federal, state, and local requirements and regulations pertinent to the waste. There are no specific handling or storage requirements for typical non-RRM waste such as office trash, wood, plastic, or metal. These solid waste materials should be accumulated using standard practices and disposed of at the local municipal landfill. Non-RRM waste shall not be disposed of at the disposal site. The contractor will make reasonable efforts to minimize the generation of non-RRM wastes and to recycle non-RRM wastes and materials per DOE Executive Order 450.1. Recycling bins are provided for paper and plastic.

Proper management of non-RRM waste also requires that it be evaluated to determine if it contains hazardous or toxic components. Non-RRM waste that contains hazardous or toxic components shall be managed in accordance with the hazardous waste regulations at 40 CFR 261, the universal waste regulations at 40 CFR 273, and the corresponding state of Utah hazardous waste and universal waste regulations at UAC R315. These management requirements encompass proper tracking, containerization, labeling, storage, treatment, transportation, disposal, and record keeping.

2.3.3 Investigation-Derived Waste

IDW shall be managed in accordance with the requirements of this plan for RRM and non-RRM waste and in a manner that is consistent with the *Technical Approach for the Management of UMTRA Ground Water Investigation-Derived Wastes* (IDW) (as revised for the UMTRA Ground Water Project) and the EPA *Guide to Management of Investigation-Derived Waste*. The *Technical Approach for the Management of UMTRA Ground Water Investigation-Derived Wastes* was developed, in part, for managing excess ground water by dispersing it on the ground near the well from which it originated. The *Guide to Management of Investigation-Derived Waste* grants greater flexibility for returning contaminated IDW, such as excess soil generated during well drilling or trenching, to its point of origination in instances when these materials will be remediated at a later date.

Following are a list of options for managing IDW:

Investigation-Derived Waste that is Residual Radioactive Material

IDW that is RRM is subject to the same management requirements as RRM with similar characteristics:

- IDW that is RRM that does not contain other hazardous components can be managed in a manner similar to other routine RRM and be disposed of at the disposal site. Alternately, such IDW that is solid, like RRM/soil, can be combined with similar RRM that is scheduled for remediation at a later date.
- IDW that is RRM/ground water that does not contain other hazardous components can be placed in the onsite evaporation pond for ground water.

- IDW that is RRM that is suspected or confirmed to contain other hazardous components shall be managed in the same manner as the source material. When feasible, such IDW should be returned to or recombined with the source material. If circumstances warrant, such IDW can be containerized and stored near the source material until proper disposition is determined. IDW that is suspected or confirmed to contain other hazardous components shall not be combined with RRM that does not contain the same hazardous components. The requirements for managing RRM that contains other hazardous components are further explained in Section 3.0.

Investigation-Derived Waste that is non-Residual Radioactive Material

IDW that is non-RRM waste must be evaluated to determine if it contains hazardous or toxic components. IDW that is non-RRM waste is subject to federal, state, and local requirements and regulations pertinent to the waste:

- IDW that is non-RRM waste that does not contain other hazardous components does not require any special management. Non-RRM IDW that is solid, such as trash, can be accumulated and disposed of in a municipal waste landfill.
- IDW that is non-RRM ground water that does not contain other hazardous components can be dispersed on the soil near the well from which the ground water was extracted.
- IDW that is non-RRM waste that contains other hazardous components must be managed in accordance with the hazardous waste regulations at 40 CFR 261 and the corresponding state of Utah hazardous waste regulations at UAC R315.
- IDW that is non-RRM ground water that contains other hazardous components that are not hazardous waste must be managed in accordance with the *Technical Approach for the Management of UMTRA Ground Water Investigation-Derived Wastes* (as revised for the UMTRA Ground Water Project). That document provides procedures for determining whether such IDW can be dispersed on the soil near the well from which the ground water was extracted.

2.3.4 Waste Acceptance Criteria

A. Dispose of the following items at the disposal site (which includes tailings pile material bound for disposal site), subject to sizing, placement restrictions, and other special management as specified:
   - Tailings, soil, organic soil matter, and rock fragments. Spread and compact as contaminated fill.
   - Plant material from tree removal, clearing, grubbing, and stripping. Process, size, and place as specified.
   - Pieces of wood, concrete, and masonry. Process, size, and place as specified.
   - Structural steel members and similar long items. Process, size, and place as specified.
   - Other structural debris including building siding of various materials. Size and place as specified.
   - Pipes and ducts. Process, size, and place as specified.

- Geo-membranes and similar products from decommissioned ponds, ditches, and temporary facilities. Process and size as specified.
- Tires excavated from or generated in the contamination areas. Process, size, and place as specified.
- Free liquids that do not pass the paint filter test, but do not contain hazardous or suspect hazardous substances. Dewater or stabilize to pass the paint filter test before placement.
- Sludge that requires stabilization for efficient handling, but does not contain hazardous or suspect hazardous substances. Stabilize as necessary before placement.
- Containerized waste and already packaged asbestos. Handle and place as specified.
- Lead-based paint and objects coated with such paint. Place as specified for debris and oversized materials.
- Contaminated trash and debris from construction operations, including contaminated personal protective equipment. Place as specified.
- Other materials as directed by the Operations Manager.

B. Dispose of the following materials in the disposal site ***only*** if specified procedures for hazardous or suspect hazardous substances have been observed and if suitable pretreatment has been performed. Disposal is subject to sizing, placement, restrictions, and other special management as specified.
   - Free liquids or sludges containing hazardous or suspect hazardous substances.
   - Waste oil, volatile organic compounds, and similar wastes.
   - Asbestos requiring protective packaging.
   - Liquid polychlorinated biphenyl (PCB) compounds.
   - Automotive batteries.
   - Materials with highly concentrated contaminants, such as metallic sludge.
   - Substances that may pose imminent safety or health hazards.

C. ***Do not*** dispose of the following materials in the disposal site.
   - Equipment that can be readily decontaminated.
   - Uncontaminated material used by the Project in the course of its activities.
   - Materials containing hazardous or suspect hazardous substances that have not been properly characterized or subjected to suitable pretreatment.
   - Other materials considered by the RAC to be unsuitable for disposal in the disposal site.

D. Materials placed in the disposal site must be processed and sized as indicated.
   - Wood, concrete, and masonry: Cut or break up to a maximum three-foot size measured in any direction.
   - Structural steel members, pipes, ducts, and other long items: Cut into maximum 10-foot lengths.
   - Concrete, clay tile, and other pipe: Crush concrete and clay tile pipe. Crush other pipes and ducts that are six inches or greater in diameter or, if crushing is impractical, cut pipes and ducts in half longitudinally. **Do not crush** asbestos-cement pipe.

- Rubber tires: Cut into two halves around the circumference.
- Geomembranes and other sheet material: Cut into strips a maximum of four feet wide by four feet long.
- Tree limbs four inches in diameter and larger: Cut into maximum 10-foot lengths.

E. The RAC will determine the acceptability of contaminated material not falling clearly under any of the waste acceptance criteria.

F. The RAC may direct in specific cases that materials subject to special management, with or without pretreatment, be disposed off site and not within the disposal site.

2.4 Waste Minimization and Pollution Prevention

Waste minimization and pollution prevention are also part of the waste management strategy. Activities shall be evaluated to identify waste minimization/pollution prevention opportunities. Potential improvements must be warranted, feasible, and cost effective to be implemented.

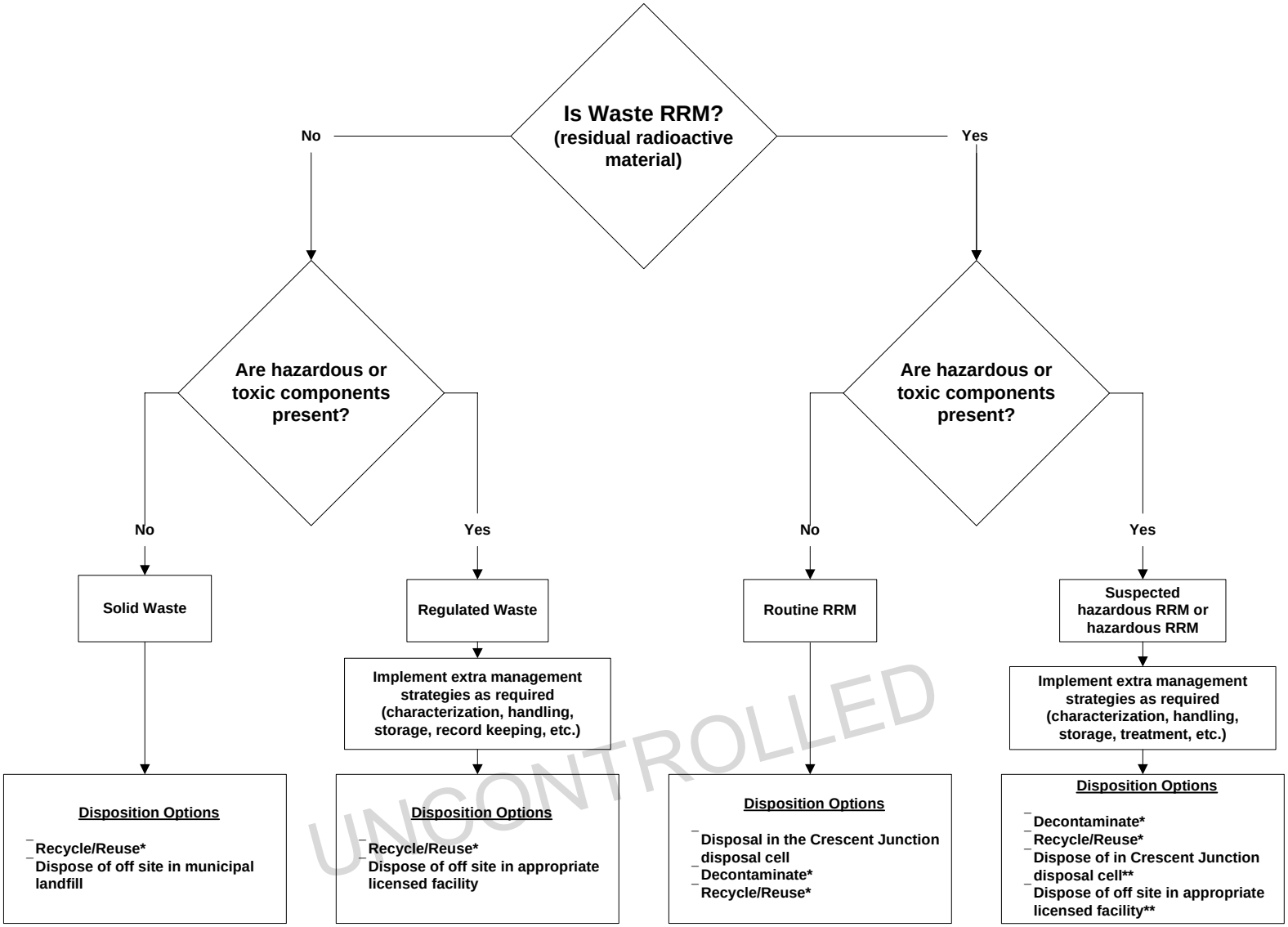
An important waste minimization/pollution-prevention method that will continually be used is keeping materials and wastes, especially materials and wastes containing hazardous components (e.g., chemicals, petroleum products, batteries), free of radioactive contamination whenever possible. Materials and wastes should not enter the CA unless required. Materials and wastes that must be taken into the CA should be protected from becoming radioactively contaminated or should be decontaminated if feasible and cost effective.

Other waste minimization/pollution-prevention methods that could be used include (in order of preference):

(1) Source reduction (by methods such as product substitution, inventory control, or equipment replacement or modification).
(2) Recycling.
(3) Decontamination.
(4) Treatment.

Site-specific planning documents should provide recommendations for waste minimization/pollution-prevention practices as applicable to the particular activities being planned. Waste minimization and pollution-prevention activities should be documented as memoranda to file as a means of tracking the performance and progress of these efforts.

The general waste management strategy is summarized in a flowchart in Figure 2−1.



*If feasible and cost effective
**Requires DOE concurrence and must meet disposal cell WAC

Figure 2–1. General Waste Management Strategy

3.0 Identification and Management of Suspected Hazardous Residual Radioactive Material and Hazardous Residual Radioactive Material

3.1 Introduction

SHRRM is RRM encountered during remediation that is suspected of containing hazardous or toxic components that pose a significant and unacceptable risk to workers or the environment. As a best management practice, further evaluation of this material is required. HRRM is RRM confirmed to contain hazardous or toxic components. This section discusses the requirements for identifying and managing SHRRM and HRRM.

3.2 Suspected Hazardous Residual Radioactive Material

Other than tailings management, historical waste management practices at the Moab site are not well understood; therefore, it is unknown what hazardous or toxic components will be encountered during remediation. These materials may include asbestos, PCBs, laboratory chemicals, unknown petroleum products, or unknown chemicals related to ore processing.

SHRRM may be indicated as a result of historical evidence, preremediation characterization or operational activities, or remediation activities. Certain historical information indicates particular areas within the CA may have been used for disposal of laboratory wastes, demolition debris, petroleum products, or trash. Trash and petroleum-contaminated soils have been encountered in the CA during some radiological investigations and excavation of water-line trenches.

The requirements for managing SHRRM include proper notification, mitigation, identification, delineation, evaluation, and hazard determination.

3.2.1 Notification

Once it has been determined that SHRRM may be present, the Operations Manager, site H&S personnel, and DOE shall be notified. Work shall be temporarily halted in the area of the potential SHRRM and continued in another area if necessary.

3.2.2 Mitigation

Whenever potential SHRRM is observed, the first priority is worker health and safety. All reasonable measures shall be taken to ensure that workers do not undergo unnecessary or unacceptable exposure to hazards. H&S will mitigate worker hazards by identifying and implementing protective measures when potential SHRRM is managed, such as when handling, excavating, or moving this material.

3.2.3 Identification

The decision to designate RRM as SHRRM shall be made on a case-by-case basis, contingent upon the circumstances and taking into consideration the following factors:

- SHRRM should be distinguishable from surrounding "normal" RRM by physical characteristics, such as color, texture, consistency, "crystal" growth, or odor that indicates the presence of an unnatural manmade substance (e.g., a chemical), or by the presence of stressed vegetation or dead wildlife potentially attributable to such substances.
- SHRRM may be identified by observations and/or physical indications experienced among workers, such as skin irritation, respiratory irritation, headaches, dizziness, nausea, or unusual taste or smell (though SHRRM or HRRM may not affect workers to any noticeable degree).
- Field instrumentation measurements or field test kit results may indicate that SHRRM is present (e.g., photoionization detector measurements, Draeger tube results).
- There should be a significant quantity or concentration of suspicious material to qualify as SHRRM, that is, a connected deposit of significant depth, area, or concentration (e.g., the physical characteristics that make it distinguishable from surrounding RRM is of significant intensity of color, odor); this quantity is not definable, but will be based on the particular circumstances.
- SHRRM may involve distinct units or containers (e.g., 55-gallon drums) that are intact and filled (or partially filled) or damaged and leaking.

RRM that simply appears different from surrounding RRM (e.g., different soil types, such as silt and clay) would not necessarily be suspected of containing hazardous or toxic components that are worth evaluating further. The other factors listed above also must be considered. SHRRM may be indicated because one or a combination of these factors is applicable.

Depending on the circumstances, it may be necessary to temporarily halt work in the area where potential SHRRM is encountered until the identification process is completed. If possible, work should continue in another area.

A record (e.g., field logbook) shall be maintained that documents the decision-making process used for determining whether a particular RRM qualifies as SHRRM.

The Operations Manager or designée shall specify qualified staff from among the Project and functional groups (RadCon, H&S, EC, or Operations groups) that are responsible for identifying SHRRM. These may include:

- Operations Manager or designee.
- Radiological Controls Supervisor or designee.

- H&S Manager or designee.
- EC Manager or designee.
- Operations field personnel.
- Remediation subcontractor personnel.

Those designated with the authority and responsibility to identify SHRRM shall receive appropriate training for performing these duties.

3.2.4 Delineation

Once SHRRM has been identified, the Operations Manager and H&S Managers shall delineate and isolate the SHRRM in situ in an area designated as a Best Management Practice Area (BMPA). The purpose of a BMPA is to segregate and temporarily store SHRRM so that these materials can be further evaluated to determine if HRRM exists. If deemed necessary, the SHRRM may be moved into a BMPA at another location to facilitate continued remediation near the affected area and/or to enable more successful evaluation of the SHRRM. Further information is provided about the BMPA in Section 3.4. The Operations Manager shall notify the contractor Project Managers and EC when SHRRM is identified.

3.2.5 Hazard Evaluation

Once the SHRRM has been delineated and the appropriate personnel have been notified, the Operations Manager, H&S Managers, and EC will work cooperatively to determine how to further investigate the SHRRM to determine if it is HRRM. The investigation approach will vary depending on the circumstances. The SHRRM could be further characterized by additional field testing or collecting samples for laboratory analysis. Field characterization activities may be directed by integrated work plan or sampling and analysis plans. EC is responsible for taking the lead in researching and recommending the evaluation approach.

3.2.6 Hazard Determination

SHRRM shall be further investigated as agreed to by the Operations Manager, H&S Managers, and EC. This group assesses the results of SHRRM investigations and determines whether this material qualifies as HRRM. The Operations Manager and other appropriate contractor staff will make an HRRM recommendation to DOE. DOE has final concurrence authority for identifying material as HRRM.

3.3 Hazardous Residual Radioactive Material

The requirements for managing HRRM include proper storage, disposition evaluation, and if applicable, mitigation.

3.3.1 Storage

Once HRRM has been identified, it will remain stored in a BMPA until final disposition is accomplished. HRRM must remain segregated from other RRM in a BMPA to ensure that additional HRRM is not created. Further information is provided about the BMPA in Section 3.4.

3.3.2 Disposition Evaluation

Once HRRM has been identified, further evaluation must be performed to determine the appropriate disposition of this material. DOE, the Operations Manager, H&S Managers, and EC shall evaluate each instance of HRRM on a case-by-case basis to determine appropriate disposition. Disposition options may include:

- Disposal of HRRM at the Crescent Junction disposal site without any special hazard mitigation other than that required to protect workers.
- Mitigation of the environmental hazards posed by HRRM prior to disposal at the Crescent Junction disposal site.
- Unforeseen circumstances may justify the disposal of particularly hazardous RRM in an appropriate off-site facility.

The contractor shall obtain DOE concurrence for the preferred HRRM disposition option prior to its implementation.

3.3.3 Mitigation

If deemed necessary, the environmental hazards posed by HRRM shall be mitigated. The contractor shall obtain DOE concurrence for any treatment methods and treatment performance levels proposed for HRRM. The Operations Managers, H&S Managers, and EC shall oversee the performance of mitigation measures. The effectiveness of the mitigation measures shall be verified prior to disposal of this material at the Crescent Junction disposal site.

Figure 3−1 is a flowchart that illustrates the process for identifying and managing SHRRM and HRRM.

3.4 Best Management Practice Area

As stated previously, a BMPA is a distinct location established for temporarily managing SHRRM or HRRM. SHRRM is managed in a BMPA so that it may be evaluated to confirm the presence of hazardous or toxic components. Confirmed HRRM is managed in a BMPA until final disposition of this material can be determined. Mitigation of the hazardous components in RRM, such as by treatment, is conducted within a BMPA. Establishment of a BMPA enables remediation to continue in surrounding non-hazardous RRM, reduces the chance that HRRM will spread into surrounding non-hazardous areas, and reduces hazards to workers.

Following are possible features of a BMPA:

- A BMPA may be established at the original location of the SHRRM or HRRM. Alternately, if deemed necessary these materials may be relocated to a BMPA that is segregated from the original location.
- SHRRM or HRRM may be stored in a BMPA in different ways, such as in bulk piles or in containers (e.g., in drums or roll-off bins).
- Multiple BMPAs may be established to manage multiple types of SHRRM or HRRM, such as uranium mill tailings, soil, chemicals, equipment, debris, or miscellaneous other materials.

Following is a summary of management controls required for a BMPA:

- A BMPA shall be a delineated and posted area (a BMPA will typically be a roped off area with an identifying sign).
- If deemed necessary and feasible, a BMPA will be bermed and plastic-lined to minimize the release of SHRRM or HRRM to the surrounding environment.
- If deemed necessary and feasible, SHRRM or HRRM in a BMPA will be covered with plastic sheeting or a tarp, containerized, or otherwise protected to minimize release to the surrounding environment.
- All containers of SHRRM or HRRM in a BMPA shall be marked or labeled with identifying information.
- SHRRM or HRRM in a BMPA shall be tracked through the use of an inventory that will be updated as SHRRM or HRRM enters or leaves a BMPA.
- SHRRM or HRRM in a BMPA shall be inspected as necessary to determine hazard conditions, ensure the integrity of containers, and minimize releases to the surrounding environment.

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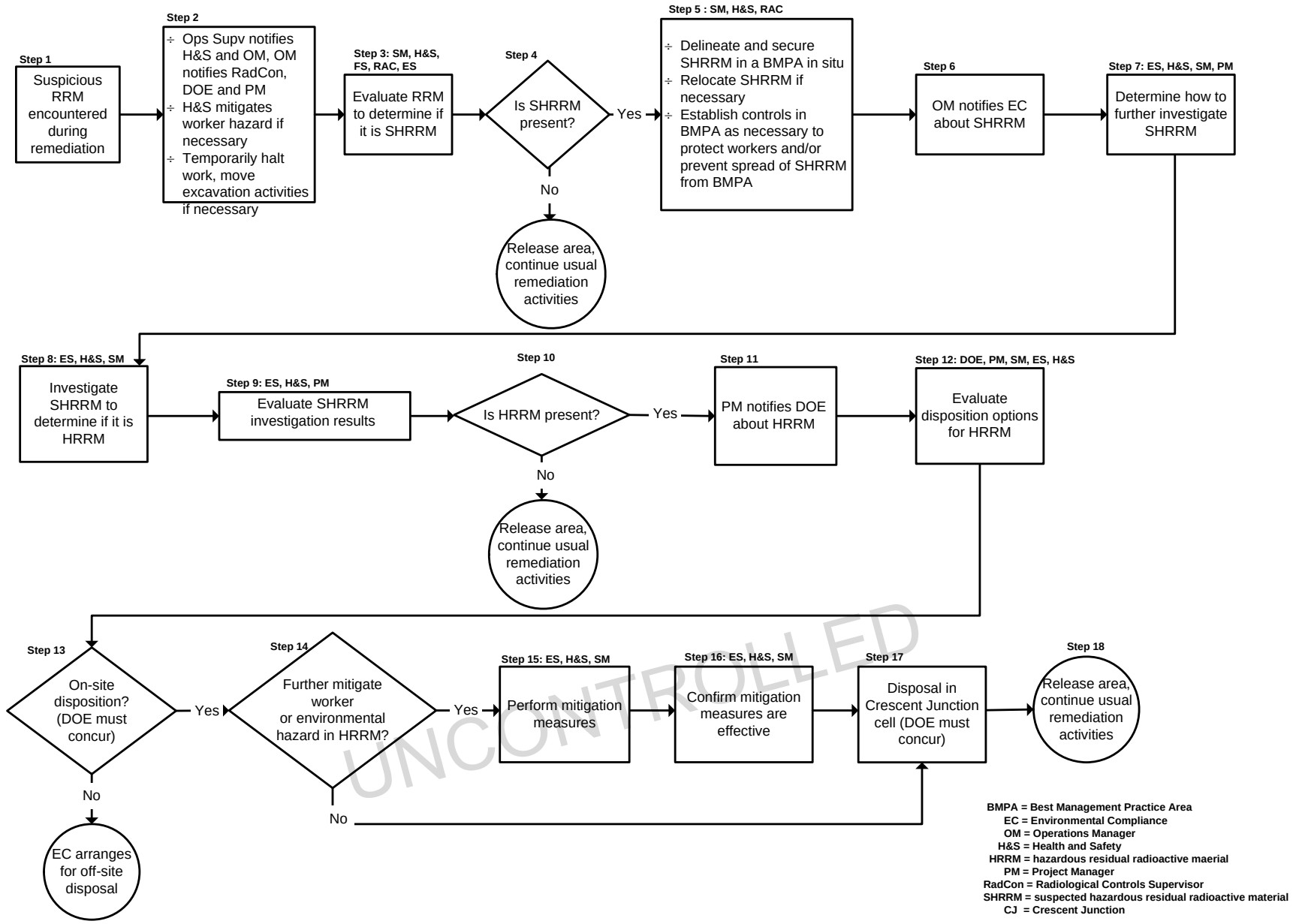

Figure 3–1. Management Process for SHRRM and HRRM

4.0 Acronyms

BMPA	Best Management Practice Area
CA	Radioactive Contamination Area
CFR	*Code of Federal Regulations*
DOE	U.S. Department of Energy
EPA	U.S. Environmental Protection Agency
EC	Environmental Compliance
H&S	Health and Safety
HRRM	Hazardous Residual Radioactive Material
IDW	Investigation-Derived Waste
NRC	Nuclear Regulatory Commission
PCB	polychlorinated biphenyl
Ra-226	Radium-226
RAC	Remedial Action Contractor
RadCon	Radiological Controls
RCRA	Resource Conservation and Recovery Act
RRM	Residual Radioactive Material
SHRRM	Suspected Hazardous Residual Radioactive Material
TAC	Technical Assistance Contractor
TSCA	Toxic Substances Control Act
UAC	Utah Administrative Code
UMTRA	Uranium Mill Tailings Remedial Action
UMTRCA	Uranium Mill Tailings Radiation Control Act
USC	United States Code
WAC	Waste Acceptance Criteria

5.0 Definitions

Best Management Practice Area (BMPA)—For the purposes of this Waste Management Plan, a BMPA is a location for temporarily managing RRM suspected of being combined or that is combined with a hazardous or toxic component until further evaluation or disposition of this material is completed.

Contaminated Area (CA)—An area containing removable surface (radioactive) contamination.

Decontamination—For the purposes of this Waste Management Plan, decontamination refers to the removal of radioactive material.

Hazardous Residual Radioactive Material (HRRM)—For the purposes of this waste management plan, hazardous RRM refers to residual radioactive material combined with a hazardous or toxic component other than radioactivity, such as hazardous chemicals, PCBs, asbestos, or unknown petroleum products.

Hazardous Waste—A solid waste, as defined in 40 CFR 261.2, which meets the definition of hazardous waste at 40 CFR 261.3. This generally refers to an RCRA characteristic or listed hazardous waste, as defined in 40 CFR 261 Subparts C and D.

Investigation-Derived Waste (IDW)—Waste generated in the field as a result of site assessment, characterization, and monitoring activities.

Non-Residual Radioactive Material (Non-RRM) Waste—Waste that does not meet the definition of RRM. Generally, non-RRM waste is either a solid waste or a regulated waste.

Regulated Waste—For the purposes of this waste management plan, regulated waste generally refers to any waste that is not RRM, but has a hazardous or toxic component that is regulated by certain environmental statutes, such as an RCRA characteristic or listed hazardous waste or a TSCA toxic substance (e.g., PCBs).

Residual Radioactive Material (RRM)— UMTRCA Section 101(7) and 40 CFR 192.01(a) define RRM as (1) waste (which the Secretary [of Energy] determines to be radioactive) in the form of tailings resulting from the processing of ores for extraction of uranium and other valuable constituents of the ores; and (2) other wastes (which the Secretary [of Energy] determines to be radioactive) at a processing site which relate to such processing, including any residual stock of unprocessed ores or low-grade materials.

Solid Waste—Any material that meets the definition of solid waste provided in 40 CFR 261.2. For the purposes of this waste management plan, solid waste generally refers to any waste that is not residual radioactive material and not combined with a regulated hazardous or toxic component.

Suspected Hazardous RRM (SHRRM)—For the purposes of this waste management plan, SHRRM refers to RRM suspected of containing a hazardous or toxic component other than radioactivity.

APPENDIX A

Waste Management Guidance for the Moab UMTRA Project

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Waste Management Guidance for the Moab UMTRA Project

The U.S. Department of Energy (DOE) is responsible for properly managing waste generated from activities near Moab, Utah, including operation, maintenance, and remediation activities. This document presents guidance for managing such waste. Adherence to this guidance will aid in the remediation of residual radioactive material (RRM), management of various wastes including transportation and disposal in the Crescent Junction disposal cell, waste minimization, and pollution prevention activities. If deemed necessary, DOE contractors may establish formal plans or procedures to direct waste management activities at the Moab UMTRA Project.

Regulatory Background

The Floyd D. Spence National Defense Authorization Act[1] (Spence Act) designated the Moab UMTRA Project as a Uranium Mill Tailings Radiation Control Act (UMTRCA) Title I processing site in 2001. The Spence Act tasked DOE with remediation of the site and requires that remediation be consistent with remediation performed at other UMTRCA Title I processing sites.[2] The U.S. Nuclear Regulatory Commission (NRC) has the authority to, concur with the remedial action remedy and design plans.

UMTRCA Title I is a stand-alone statute and is the overriding authority for the remediation of RRM at Title I processing sites. Other environmental statutes such as the Resource Conservation and Recovery Act and the Toxic Substances Control Act do not have regulatory authority over RRM or its management as waste.[3]

The state of Utah, though it is an NRC agreement state, lacks the authority to regulate RRM at the Moab UMTRA Project. However, the state of Utah has the authority to regulate certain activities over which it maintains jurisdiction, such as the management of non-RRM waste. For example, wastes that enter the public domain such as water discharged from treatment systems and site air emissions may be subject to state jurisdiction through the Utah Pollutant Discharge Elimination System and the Utah Clean Air Act, respectively.

Wastes will be managed according to the guidelines and requirements of UMTRCA, the United States Code Title 42 Section 7901 *et seq.*, and the *Code of Federal Regulations* Title 40 Part 192, "Health and Environmental Protection Standards for Uranium and Thorium Mill Tailings," and will comply with applicable federal, state, and local statutes, ordinances, and regulations.

[1] Floyd D. Spence National Defense Authorization Act for Fiscal Year 2001, Public Law 106-398.
[2] The Spence Act includes a few administrative exceptions to UMTRCA for the remediation of the Moab UMTRA Project, such as the appropriation of funds.
[3] UMTRCA makes a clear statutory and regulatory distinction between Title I inactive uranium millsites and Title II active uranium millsites. UMTRCA provides authority to regulate RRM at Title I sites and by-product material at Title II sites. Therefore, RRM and by-product material are not equivalent in any statutory or regulatory sense with regard to waste management. Because the Spence Act designated the Moab UMTRA Project an UMTRCA Title I site, the on-site radioactive material is RRM, not by-product material.